

# Commercial Spaceflight and NASA

Bretton Alexander  
President  
Commercial Spaceflight Federation

# Benefits to NASA

- **Free up NASA resources for exploration**
  - Commercial in Earth Orbit allows NASA to focus on going beyond
- **Close the gap**
  - Commercial rockets already exist
  - Servicing ISS is a simpler mission than exploration
- **Reduce launch costs**
  - Flying existing rockets at higher flight rates reduces costs per launch
- **Unlock the potential of the Space Station**
  - Fly more cargo and astronauts to ISS than ever before

# Benefits to the Nation

- Flying more people to space increases support for space exploration
- U.S. economic competitiveness (regaining the commercial launch market from Europe, Russia, India, etc.)
- Unlock new industries and markets in space
- “A Space Program for Everyone”
  - Public engagement with average people flying to space
  - More opportunities for student-built space payloads
  - Entrepreneurial excitement

# A New Partnership

- Every U.S. spacecraft (Mercury, Gemini, Apollo and Shuttle) has been built by U.S. industry *in partnership with NASA*
- Will still be true under “Commercial Crew”
- A new partnership between NASA and U.S. industry:
  - Developed, owned, and operated by the private sector
  - To meet government needs *while enabling non-government uses*
  - A change in contractual mechanism – Firm Fixed-Price agreements with private investment, vs. traditional “cost plus award fee” contracts
  - NASA establishment of safety and program requirements, *but not dictating specific design*

**NASA will be there every step of the way**

# Enabling New Markets

- NASA may very well dominate early use of commercial vehicles...*but other markets will come*
- New markets include:
  - Other Governments – for national pride, science, training
  - Businesses – exploit microgravity for ability to develop materials, pharmaceuticals, and other processes
  - “Tourists” – already a small number have paid \$20-35 million each to fly on Russia’s Soyuz, leading the way for the rest of us, *just as in aviation*
- Private spaceflight likely to dominate within a couple decades

Payback to U.S. leadership in space, the economy and enhanced safety will be immeasurable

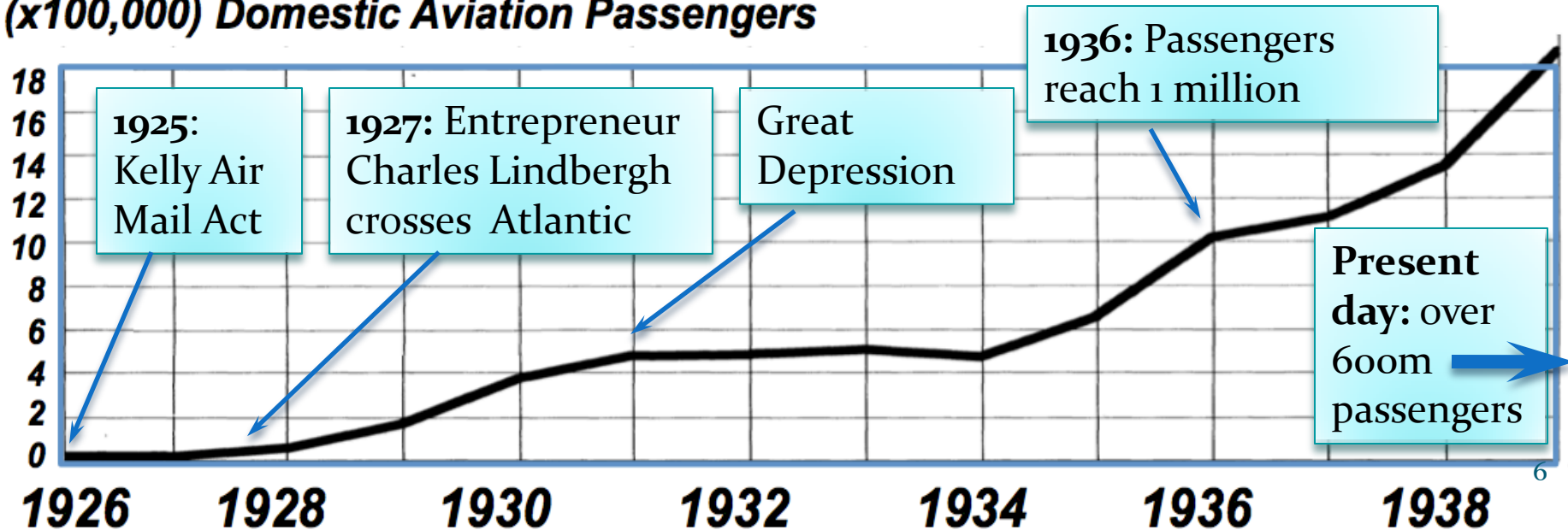
# Aviation as an Analogue

Government helped jump-start commercial passenger aviation:

- **R&D** – National Advisory Committee for Aeronautics (NACA) established in 1915 to develop technologies to benefit industry
- **Customer** – Air Mail Act of 1925 (Kelly Act) drove demand
- **Developer and Operator** – government-unique military aviation

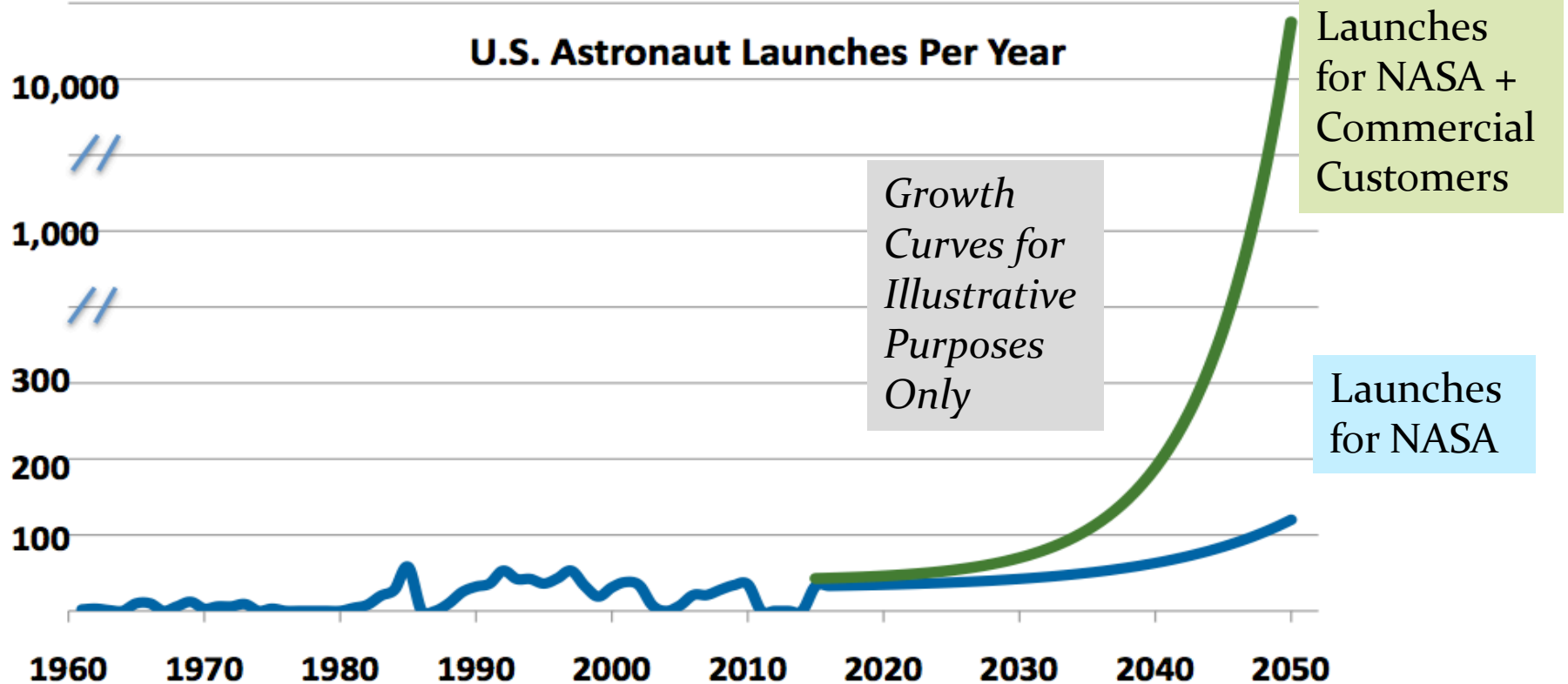
Result: Golden Age of Aviation, growth in number of passengers:

**(x100,000) Domestic Aviation Passengers**



# Jumpstarting the Same Virtuous Cycle for Human Spaceflight

U.S. Astronaut Launches Per Year



Mercury-  
Apollo Era

Space Shuttle Era

Post-Shuttle Era

# Direct Jobs Created by Commercial Crew

- 11,800 direct jobs per year over five years result from NASA's new \$6.1 billion Commercial Crew and Cargo development funds
  - Peak of 14,200 direct jobs in FY2014
- Does *not* include:
  - \$500 million in Commercial Orbital Transportation Services (COTS) funding already spent
  - \$3.5 billion in Commercial Resupply Services (CRS) already contracted for cargo delivery to the International Space Station through 2015
  - \$2.1 billion for 21<sup>st</sup> Century Spaceport upgrades
  - Cargo and crew services flights to the International Space station *after* 2015

Estimated Direct Jobs Resulting from Expenditure of \$6.1B Commercial Crew and Commercial Cargo Budget					
	FY2011	FY2012	FY2013	FY2014	FY2015
<b>Total</b>	7,520	14,200	14,010	12,188	11,031



# Long-Term Job Creation

Existing Markets

Enabled Markets

Growth Markets

**Satellites**

Commercial  
NASA  
DoD

**Space  
Station**

Crew & Cargo

Fuel Depots

Technology  
Flight  
Demos

**Private Space  
Facilities**

Industrial Research  
Space Tourism  
Sovereign Clients

Spaceflight  
Training

Payload  
Processing

Launch

Launch Site  
Tourism

Ground Activities